

# Analysis of the relationship between personality traits and Internet addiction

K. RACHUBIŃSKA, A. CYBULSKA, M. SZKUP, E. GROCHANS

Department of Nursing, Pomeranian Medical University, Szczecin, Poland

**Abstract.** – **OBJECTIVE:** The issue of ‘new media’ addictions has been described in literature for many years. For almost a decade now researchers have been emphasizing that addiction does not have to be caused only by various substances but also by contact with digital technologies. Behavioral addictions are a growing problem in the society. Digital technologies are used by people of different ages, and their number is increasing every year. Precise reasons for the development of addictions remain unknown. In the case of behavioral addictions, especially Internet addiction, the significance of personality traits and behaviors predisposing an individual to addiction, such as depressiveness, anxiety, hostile attitude, aggression, impulsiveness, psychotic behaviors, shyness and self-esteem disorders, are emphasized. The aim of this study was a general assessment of the level of Internet addiction with regard to personality traits according to the Big Five model by Costa and McCrae.

**SUBJECTS AND METHODS:** The study involved 556 women, whose average age was 34 years and who met the inclusion criteria: female sex, age of 18 years or above, place of residence in West Pomeranian Voivodship, an informed consent for participation in the study, and completion of the questionnaire forms set. The study was conducted using a diagnostic poll method with a questionnaire technique. To carry out the analysis both author’s own and standardized tools were used: the author’s questionnaire covering socio-demographic data, the NEO-Five Factor Inventory which assesses the levels of personality traits, and the Internet Addiction Test used to measure behaviors and characteristics related to compulsive use of the Internet.

**RESULTS:** Most (70.9%) of the studied women were average users of the Internet, 25% of respondents were at risk of addiction, and the least numerous group of women (4.1%) was addicted to the Internet. Conscientiousness negatively correlated with Internet addiction. Openness to experience was conducive to Internet addiction. A positive link between neuroticism and Internet addictions was established. No significant relationships between Internet addiction and extraversion as well as agreeableness were demonstrated.

**CONCLUSIONS:** The type of personality of the studied women implicated relationships to Inter-

net addiction. Neuroticism might be a personality trait that particularly predisposes to an increased risk of Internet addiction. Openness to experience was conducive to Internet addiction. Conscientiousness negatively correlated with Internet addiction.

*Key Words:*

Behavioral addiction, Women, Internet disorder.

## Abbreviations

ICD-10, International Classification of Diseases 10th; DSM-5, the fifth edition of the *Diagnostic and Statistical Manual of Mental Disorders*; IAT, The Internet Addiction Test.

## Introduction

The issue of ‘new media’ addictions has been described in literature for many years. For almost a decade now researchers have been emphasizing that an addiction does not have to be caused only by various substances but also by contact with digital technologies. Behavioral addictions are a growing problem in the society. Digital technologies are used by people of different ages, and their number is increasing every year. Precise reasons for the development of addictions are unknown. In case of behavioral addictions, in particular ones related to the Internet, the significance of personality traits is stressed<sup>1</sup>.

The negative consequences of using the Internet were first described in 1996. In 1998 during the congress of American Psychologic Society Kimberly Young presented results of her studies which she conducted on 600 Internet users, 396 of whom showed clinical symptoms of a serious addiction. Assessment of Internet addiction was carried out based on the modified criteria applicable to pathological gambling included in the DSM-IV. Studies of Kimberly Young have shown a significant disturbance in impulse control in the study group. Since that time different aspects of disorders related to excessive use of the Internet have been analyzed. At the beginning, research

primarily focused on specifying this phenomenon and examining behavioral patterns in addicts. Some studies<sup>2,3</sup> concentrate mainly on etiological factors and main trajectory of addictions.

Currently, it is assumed that a pronounced difference exists between the majority of Internet users who control their presence on the Internet and the smaller group of those who do not. Users who control their presence online use the Internet as an effective communication tool, the source of entertainment, new business relationships and personal development. By contrast, users who lost their sense of control over their presence online increase their activity over time and indulge in Internet use simultaneously, neglecting their everyday duties and replacing them with virtual reality<sup>2,4,5</sup>.

Personality predispositions play an essential role in Internet addiction. Costa and McCrae, the authors of the five-factor model, distinguished central components of personality: basic tendencies, characteristic adaptations and self-image, also known as the Big Five: neuroticism, extraversion, openness to experience, conscientiousness and agreeableness. Neuroticism reflects emotional stability and the human tendency to experience mental suffering. Extraversion shows a tendency to be outgoing and experience positive emotions. Openness to experience represents the individual's readiness to consider alternative approaches, intellectual curiosity. Agreeableness, on the other hand, is another aspect of interpersonal behavior, reflecting trust, empathy, and ability to cooperate. The fifth dimension, conscientiousness determines the degree of self-organization, diligence, and scrupulousness of an individual. People addicted to the Internet, computer games and social networking sites differ significantly from those who are not dependent in terms of the levels of personality traits, such as agreeableness, neuroticism and conscientiousness. Addicted people are more prone to negative emotions and unpleasant experiences, which may indicate a higher level of neuroticism. Lower conscientiousness of addicts means less motivation to act and achieve their goals. Addicts cannot cope in the real world, they often experience negative emotions, quickly give up their goals, see themselves and others in a negative light, escaping into virtual reality. Virtual reality keeps them safe and anonymous. The virtual world is devoid of fear that the individual experience in real contacts, hence the tendency to addiction among people with higher neuroticism<sup>6,7</sup>.

Some personality traits, such as psychopathy and neuroticism, predispose to addictions. Other factors that contribute to the development of Internet addiction are Escapist Coping Strategies, shyness, lack of abilities to establish and maintain relationships, desire to expand social circles, greater need for control with coexisting increased social anxiety, discrepancy in self-image (creating an ideal self-image in parallel reality online), and perseverance<sup>8-12</sup>.

The causes of addictions have not been fully understood. The primary reasons for addictions might be the innate traits of temperament (i.e., impulsiveness of behaviors and decisions) which influence the susceptibility to behavioral and chemical addiction. In accordance with the addictive personality concept, individuals with this problem are likely to become addicts, regardless of what they are addicted to<sup>13</sup>.

The aim of this study was a general assessment of the level of Internet addiction with regard to personality traits according to the Big Five model by Costa and McCrae.

## Subjects and Methods

### *Participants*

The study included 556 participants, whose average age was 34 years and who fulfilled the following inclusion criteria: female sex, age of 18 or above, residing in northwest of Poland (West Pomeranian Voivodeship), informed consent for participation in the study, and completion of the set of questionnaire forms. Before implementing the project, an acceptance from the Bioethical Commission of the Pomeranian University in Poland was obtained (KB-0012/518/12/16).

### *Measures*

The study was conducted using a diagnostic poll method with a questionnaire technique. In order to assess the prevalence of Internet addiction in adult women, the following research tools, both author's own and standardized, were used:

### *Internet Addiction Test (IAT)*

This instrument was developed by an American psychologist, Kimberly Young, in 1998 based on the criteria contained in the American diagnosis system DSM-IV for pathological gambling. The IAT was created for Internet users (individuals who use the Internet daily). The questions measure behaviors and qualities related to compulsive In-

Internet use, such as compulsiveness, escapism and dependency. They also concern issues related to addiction regarding personal, professional and social spheres. Internet addiction is understood as a disorder of impulse control and term 'the Internet' refers to all kinds of online activities. The scale is primarily used for general assessment of Internet addiction, however, while interpreting the results of the IAT one might also take into consideration the meaning of individual questions in order to evaluate specific symptoms: salience, excessive use, negligence of work, anticipation, lack of control, negligence of social life<sup>14,15</sup>.

This questionnaire has the best-documented psychometric properties and the greatest number of adaptations worldwide. It is available in English, Italian, Chinese, French and Turkish. The Polish version of the IAT was prepared by Hawi et al<sup>15</sup>. Earlier, validation of the IAT was carried out by Poprawa<sup>16</sup> in 2011, however, this version diverged from the original: number of items was increased to 22 and their structure was changed from questions to affirmative sentences rated by respondents on a five-point scale: number 1 stood for seldom, 2 – sometimes, 3 – often, 4 – very often, 5 – always. The maximum score was 100 points. Results ranging from 0 to 39 points described an average Internet user, results from 40 to 69 points represented an Internet user who occasionally or often experienced difficulties caused by using the Internet, and scores of 70 or higher indicated a problematic Internet usage<sup>2,17,18</sup>.

### **NEO-Five Factor Inventory (NEO-FFI)**

The questionnaire is used to diagnose personality traits described in the popular five-factor model called the Big Five. This instrument consists of 60 self-reporting statements, whose validity was assessed by respondents on a five-point scale, where 1 meant 'I strongly disagree', 2 – 'I disagree', 3 – 'I have no opinion', 4 – 'I agree', and 5 – 'I strongly agree'. Those statements create five measuring scales for: neuroticism, extraversion, openness to experiences, agreeableness and conscientiousness – the Big Five. The Big Five is a personality model created by Costa and McCrea which includes five personality aspects listed above and each is a set of so-called components, meaning partial characteristics. Based on that, it is highly possible to explain and predict behaviors, reactions and ways of experiencing different situations by a specific individual and the manner in which others react to the said individual<sup>6,7,19</sup>.

The result of each of the NEO-FFI scales is calculated via summarizing points scored by a respondent. For each answer one can score between 0 and 4 points. In some statements the scoring is reversed. Each scale consists of 12 positions, and thus raw results can range from 0 to 48 points. A higher score on a specific scale reflects a higher level of the trait. After calculation, raw results need to be converted to normalized results, i.e., sten scores, using ready norm tables. Interpretation of results includes two aspects: psychometric and psychological. Psychometric interpretation implies the necessity to use compartmental methods of estimation. After a correct psychometric interpretation, it is possible to carry out an exact psychological interpretation of the results. The interpretation consists of two aspects: profile and functional. The profile interpretation allows deduction based on single traits as well as their configurations. It aims to create a psychological description with its individual characteristics. The functional interpretation focuses on the meaning of personality traits and their role in the process of adapting to changing environment. It is intended to produce a description of the capabilities of an individual to adapt to environment (for example professional or school)<sup>6,7</sup>.

### **Author's Own Questionnaire**

The author's own questionnaire included closed and semi-closed questions, the purpose of which was to obtain sociodemographic data, i.e., age, education, marital status, place of residence, employment status.

### **Procedure**

The survey was conducted between October 2016 and May 2017. The inclusion criteria were age (> 18 years), female sex, place of residence in the West Pomeranian Voivodeship and a lack of self-reported mental disorders. The exclusion criteria were not meeting the inclusion criteria and clinically confirmed mental disorders. Participation was anonymous and voluntary. The respondents were informed in writing about the purpose and course of the research, and that they can resign at any stage of the study. The data collectors explained to all participants the requirements of the questionnaires using standard instructions and emphasized the authenticity and integrity of all answers. The questionnaires were collected immediately after they had been completed. The participants were not compensated for participating in the study. The average time for completing the measures was approximately 35 min.

Statistical analysis was performed using STATISTICA 13.0 PL (Tibco Software Inc, Palo Alto, CA, USA) and StataSE 12.0 (StataCorp LP, TX, USA). Statistical significance was set at a  $p$ -value below 0.05. All tests were two-tailed. Nominal and ordinal data were expressed as percentages, while interval data were expressed as a mean value  $\pm$  standard deviation in the case of normal distribution or as the median (Me) and lower (Q1) / upper (Q3) quartile in the case of data with skewed or non-normal distribution. For comparison of data, the Student's  $t$ -test for independent data (also after logarithmic transformation of data, if appropriate) or the non-parametric Mann-Whitney U test were used. Categorical variables were compared using  $\chi^2$ -tests. To assess the relationship between variables, the ordinary least square regression was used with the Pearson correlation coefficient as a measure of association. In the case of non-normal residuals, the Spearman rank correlation was used.

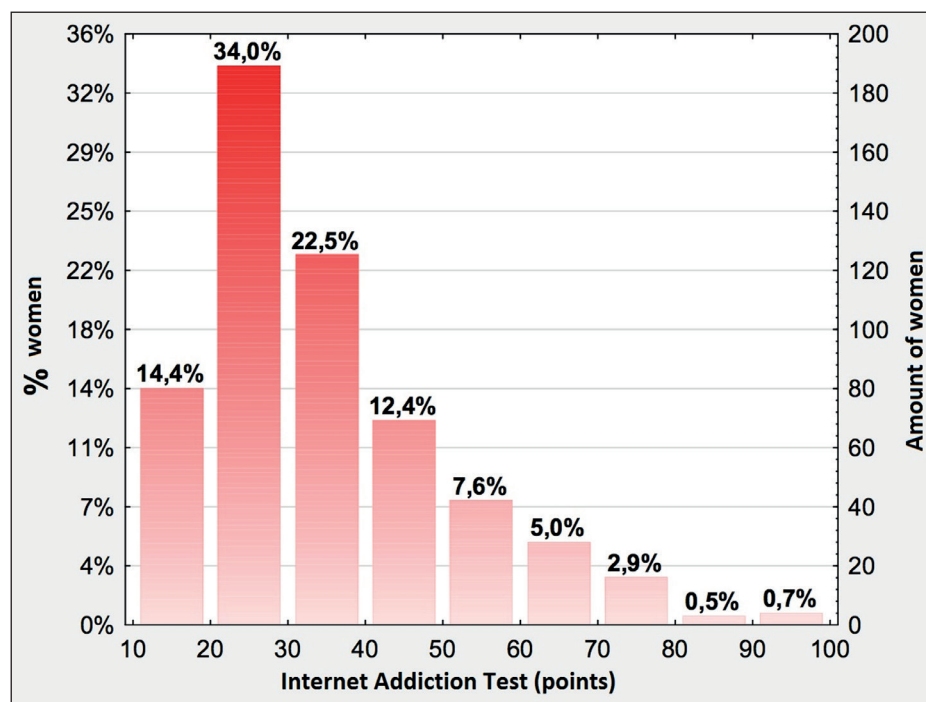
The results were obtained as part of a larger investigation to analyze the influence of a wide array of social and psychological factors on behavior addictions among women. The study was carried out in accordance with the Declaration of Helsinki, and the protocol was approved

by the Bioethical Committee of the Pomeranian Medical University in Szczecin (approval number KB-0012/518/12/16). All subjects were informed about the study and all provided informed consent.

## Results

Overall, 556 women aged  $34 \pm 15$  years (median = 27 years, lower/upper quartile = 22.0/45.0 years) were examined. Among the studied women, 269 (48.4%) had a university degree, 263 (47.3%) lived in a city with more than 100 thousand residents, 370 (66.5%) were married / in a formal relationship, 496 (89.2%) were employed.

The majority (70.9%) of respondents were average users of the Internet. In the study group, 25% of women were at risk of addiction (40-69 points on the IAT scale), and women addicted to the Internet were the least numerous group-4.1% (above 70 points on the IAT scale). The average score for the Internet Addiction Test was  $25.8 \pm 15.8$ , and the maximum score was 100 points. Most of respondents (34%) scored between 20 and 29 points, and the least numerous group



**Figure 1.** The distribution of the surveyed women's scores on the Internet Addiction Test (IAT).



**Table I.** Descriptive characteristics of psychological variables in the studied group of women.

Personality according to NEO-FFI	M	-95%CI	+95%CI	Me	Min – Max	Q1 – Q3	S
Neuroticism	22.3	21.5	23.1	21	1 – 48	15 – 28	9.3
Extraversion	29.1	28.5	29.7	29	8 – 48	24 – 34	6.9
Openness to experience	27.2	26.7	27.8	26	6 – 47	23 – 31	6.1
Agreeableness	30.3	29.8	30.9	30	8 – 48	27 – 34	6.2
Conscientiousness	33.3	32.7	33.9	34	4 – 48	29 – 38	7.2

(0.5%) scored between 80 and 89 points on the IAT (Figure 1).

The data obtained via the NEO-FFI Personality Inventory showed that the greatest intensity of characteristics in the studied group of women was demonstrated in the subscales: conscientiousness ( $33.3 \pm 7.2$ ), then agreeableness ( $30.3 \pm 6.2$ ), followed by extraversion ( $29.1 \pm 6.9$ ), and neuroticism ( $22.3 \pm 9.3$ ) (Table I).

Table I. Descriptive characteristics of psychological variables in the studied group of women.

*M*–mean, *CI*–confidence interval, *Me*–mediana, *Q<sub>1</sub>*–lower quartile, *Q<sub>3</sub>*–upper quartile, *S*–standard deviation

A statistically significant positive moderate correlation between the score on the Internet Addiction Test and the neuroticism subscale ( $r = 0.33; p < 0.001; R^2 = 11.1\%$ ) was found. The higher the neuroticism, the greater the risk of Internet addiction (Figure 2).

A statistically significant weak positive correlation between the score on the Internet Addiction Test and the openness to experience subscale was established ( $r = 0.15; p < 0.001; R^2 = 11.1\%$ ) (Figure 3).

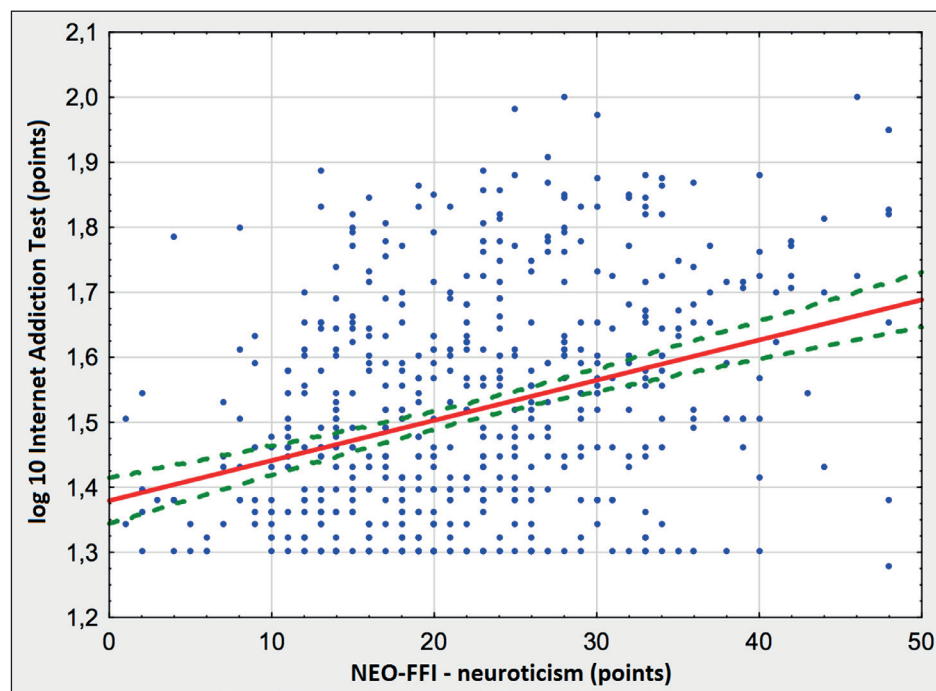
A statistically significant weak negative correlation between the score on the Internet Addiction Test and the conscientiousness subscale was found ( $r = -0.22; p < 0.001; R^2 = 4.9\%$ ) (Figure 4).

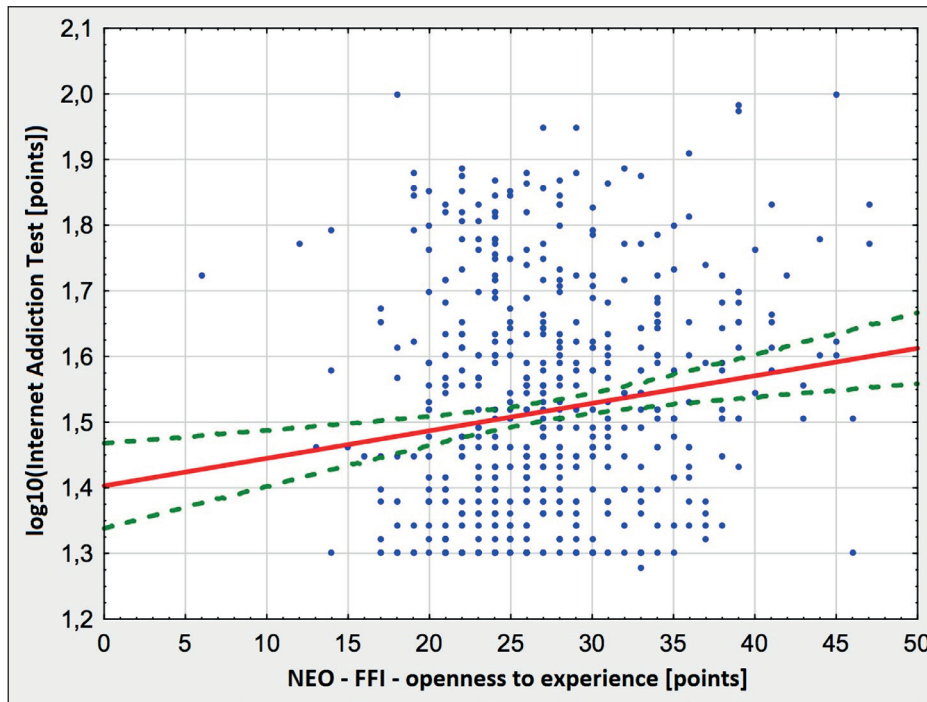
No statistically significant relationships between Internet addiction and the following NEO-FFI traits: extraversion ( $r = 0.03; p = 0.45$ ) and agreeableness were established ( $r = -0.07; p = 0.10$ ).

## Discussion

Personality predispositions are an underlying element of Internet addictions. Individuals addicted to the Internet significantly differ from

**Figure 2.** Linear regression model between the score on the Internet Addiction Test and the neuroticism subscale in the group of the studied women.

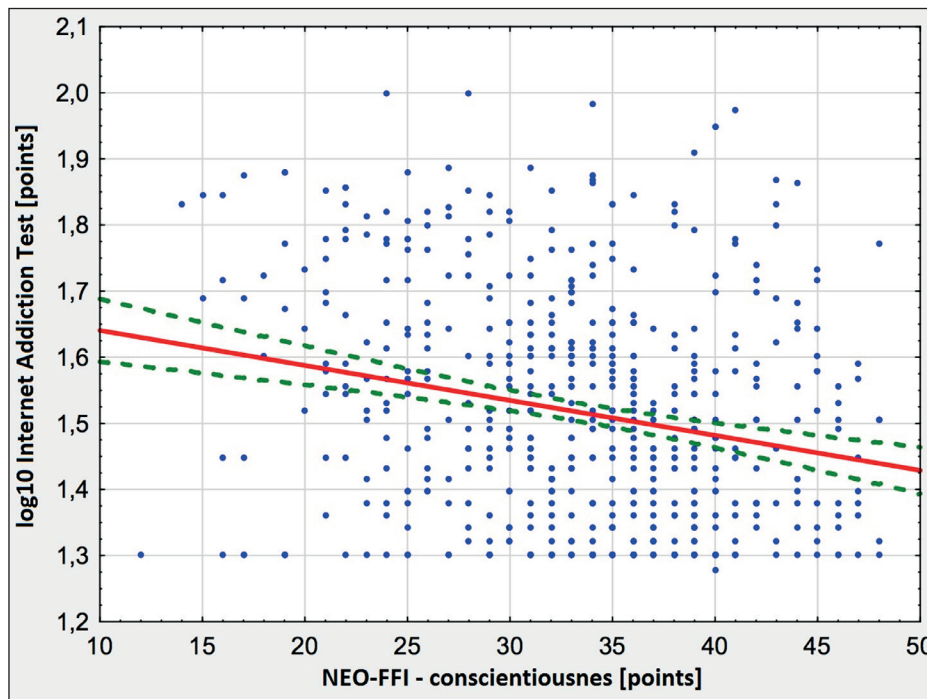




**Figure 3.** Linear regression model between the score on the Internet Addiction Test and the score on the NEO-FFI openness to experience subscale in the studied group of women.

unaddicted ones in terms of personality traits, such as agreeableness, neuroticism and conscientiousness. Addicted individuals are more susceptible to negative emotions and unpleasant situations, which might indicate a higher level of

neuroticism. Lower conscientiousness means less motivation to act and achieve set goals. Addicts cannot cope with the real world, often experience negative emotions, quickly resign from pursuing goals, see themselves and others in negative light,



**Figure 4.** Linear regression model between the Internet Addiction Subscale score and the NEO-FFI conscientiousness subscale in the studied group of women.

hence fleeing to virtual reality. Virtual reality provides them with safety and anonymity. Cyberspace lacks fear that they experience in real contacts, hence the tendency to become addicted among individuals with higher level of neuroticism<sup>18,20</sup>.

Author's own studies showed that the type of personality of the studied women implicated relationships in terms of Internet addiction. Greater severity of Internet addiction was observed in neurotic women. High conscientiousness was less of a threat with regard to behavioural addictions. Available studies, that focused on relationships between five personality characteristics and Internet addiction, indicated that the greatest effect occurs between Internet addiction and conscientiousness, and the weakest between Internet addiction and openness to new experiences. It was concluded that all five personality traits have a significant influence on Internet addiction. Openness to new experiences, conscientiousness, agreeableness and extraversion were negatively linked to Internet addiction, while relationship with neuroticism was positive<sup>20-26</sup>.

According to Müller et al<sup>27</sup>, people with higher scores on the Internet Addiction Test spent more time using the Internet and obtained lower scores for extraversion, agreeableness, conscientiousness, emotional stability and openness to experience. The respondents who scored higher on those scales were introverted, neurotic and had lower levels of agreeableness, conscientiousness and openness to experience. Błachnio et al<sup>28</sup> indicated that individuals with high level of neuroticism and low levels of extraversion and conscientiousness more often become addicted to the Internet.

The personality traits described in this study might be considered both as protective and risk factors. Negative link between conscientiousness and Internet addiction indicates that conscientiousness might serve a protective factor. Conscientious individuals are disciplined, have a sense of duty, are careful and motivated to achieve goals which allow them to control Internet usage at work, as well as in social and family life, which has also been confirmed by other researchers<sup>29-32</sup>. Similarly, agreeableness might be a protective factor against Internet addiction. Individuals with low level of agreeableness tend to present aggressive and hostile attitudes. They can exhibit such demeanour online since anonymity allows them to think that they can get away with it<sup>33-38</sup>.

Costa et al<sup>7</sup> showed a negative correlation between extraversion and Internet addiction. The

tendency of extraverts to assertive behaviours might protect them against Internet addiction. At the same time, extraverts may less frequently get involved in virtual relationships since they are able to engage in satisfying and close face-to-face relationships<sup>39-43</sup>. Kuss et al<sup>20</sup> indicated that greater openness to experiences and participation in online games increased risk of developing Internet addiction. A higher need to seek novelties is associated with openness to experience, and individuals open to new experiences are characterised by a high level of interest and curiosity. In this respect, both real and online environment might satisfy their curiosity. Presumably, due to real experiences, which are more realistic than those in the virtual world, individuals with higher scores on the openness to experience subscale choose real, not online, life. The studies of Hwang et al<sup>36</sup> and Rahmani et al<sup>42</sup> indicate a positive link between openness to new experiences and Internet addiction. In contrast, Batigün et al<sup>40</sup> suggests a lack of any relationships between personality traits and Internet addiction. Numerous authors confirm that neuroticism might be a risk factor for Internet addiction. It can be assumed that individuals with high neuroticism refrain from direct contact with others and use the Internet in order to do so. Neuroticism manifests itself as a tendency to experience unpleasant emotions such as anxiety, fear and depression<sup>35,42-46</sup>.

People of all ages use digital technology, and their number increases every year. Internet addiction is becoming a more and more serious problem in society. Ours was the first such large research on Internet addiction conducted in the population of adult women. It is necessary to further analyze the influence of personality traits on Internet addiction, to identify risk groups, and to implement interventions preventing this addiction through, for example, therapy.

## Conclusions

The type of personality of the studied women implicated relationships to Internet addiction. Neuroticism might be a personality trait that particularly predisposes to an increased risk of Internet addiction.

Openness to experience was conducive to Internet addiction. Conscientiousness negatively correlated with Internet addiction.

### Ethics Approval and Consent to Participate

The study was carried out in accordance with the Declaration of Helsinki, and the protocol was approved by the Bioethical Commission of Pomeranian Medical University in Szczecin (approval number KB-0012/518/12/16). All subjects were informed about the study and all provided informed consent.

### Declaration of Funding Interests

This study was funded in part by the Pomeranian Medical University in Szczecin for maintaining the research potential, research, development work and related tasks to support the development of young scientists and participants of doctoral studies, grant number MB-302-240/18.

### Authors' Contribution

Material preparation, data collection and analysis were performed by A.C., M.S., K.R., E.G. And A.O. Study concept and design K.R., E.G., analysis and interpretation of data A.C., statistical analysis A.O., obtained funding M.S., study supervision E.G. The first draft of the manuscript was written by K.R. and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

### Conflict of Interests

The authors declare that they have no conflict of interest.

## References

- 1) Lelonek-Kuleta B. Uzależnienia behawioralne – podstawy teoretyczne. Wydawnictwo Uniwersytetu Kazimierza Wielkiego, 2014.
- 2) Ross C, Orr ES, Sisic M, Arseneault JM, Simmering MG, Orr RR. Personality and motivations associated with Facebook use. *Comput Hum Behav* 2009; 25: 578-586.
- 3) Young K. Internet Addiction: Diagnosis and Treatment Considerations. *J Contemp Psychother* 2009; 39: 241-246.
- 4) Pużyński S, Pilecki M, Rymaszewska J, Szulc A, Sidorowicz S, Wciórka J, Brykczyńska C. Klasyfikacja zaburzeń psychicznych i zaburzeń zachowania w ICD-10. Opisy kliniczne i wskazówki diagnostyczne. Vesalius, Kraków 2000.
- 5) Gątecki P, Świącicki Ł. Kryteria diagnostyczne z DSM – 5. Edra Urban & Partner, Wrocław, 2015.
- 6) Zawadzki B, Strelau J, Szczepaniak P, Śliwińska M. Inwentarz osobowości NEO-FFI Costy i McCrae. Pracownia Testów Psychologicznych PTP, Warszawa, 1998.
- 7) Costa PT, McCrae RR. The Revised NEO Personality Inventory (NEO-PI-R). Sage Publications, 2008.
- 8) Tosun LP, Lajunen T. Why do young adults develop a passion for Internet activities? The associations among personality, revealing “true self” on the Internet, and passion for the Internet. *Cyberpsychol Behav Soc Netw* 2009; 12: 401-406.
- 9) Mehroof M, Griffiths MD. Online gaming addiction: The role of sensation seeking, self-control, neuroticism, aggression, state anxiety, and trait anxiety. *Cyberpsychol Behav Soc Netw* 2010; 13: 313-316.
- 10) Campbell AJ, Cumming SR, Hughes I. Internet use by the socially fearful: Addiction or therapy? *Cyberpsychol Behav* 2006; 9: 69-81.
- 11) Lee BW, Stapinski LA. Seeking safety on the internet: Relationship between social anxiety and problematic internet use. *J Anxiety Disord* 2012; 26: 197-205.
- 12) Mottram AJ, Fleming MJ. Extraversion, impulsivity, and online group membership as predictors of problematic Internet use. *Cyberpsychol Behav* 2009; 12: 319-321.
- 13) Janas-Kozik M, Krzystanek M. Uzależnienia behawioralne. Skrypt dla studentów i lekarzy. Śląski Uniwersytet Medyczny w Katowicach, 2017.
- 14) Pyżalski J. Czynniki chroniące polską młodzież przed podejmowaniem zachowań ryzykownych/problemowych w świetle wybranych badań. Wyd. Uniwersytetu Kazimierza Wielkiego, 2014.
- 15) Hawi NS, Błachnio A, Przepiórka A. Polish validation of the Internet Addiction Test. *Comput Human Behav* 2015; 48: 548-553.
- 16) Poprawa R. Test problematycznego używania Internetu. Adaptacja i ocena psychometryczna Internet Addiction Test K. Young. *Przeł Psychol* 2011; 54: 193-216.
- 17) Kaptis D, King DL, Delfabbro PH, Gradisar M. Withdrawal symptoms in internet gaming disorder: A systematic review. *Clin Psychol Rev* 2016; 43: 58-66.
- 18) Brand M, Young KS, Laier C. Prefrontal control and Internet addiction: a theoretical model and review of neuropsychological and neuroimaging findings. *Front Hum Neurosci* 2014; 8: 375.
- 19) Dong G, Potenza MN. A cognitive-behavioral model of Internet gaming disorder: Theoretical underpinnings and clinical implications. *J Psychiatr Res* 2014; 58: 7-11.
- 20) Kuss DJ, Shorter GW, van Rooij AJ, van de Mheen D, Griffiths MD. The Internet addiction components model and personality: Establishing construct validity via a nomological network. *Comput Hum Behav* 2014; 39: 312-321.
- 21) Ebrahimpour A, Rajabali F, Yazdanfar F, Azarbad R, Nodeh MR, Siamian H, Vahedi M. Social network sites as educational factors. *Acta Inform Med* 2016; 24: 134.
- 22) Madaiah M, Seshaiyengar CT, Suresh P, Muniapanna S, Sonnappa SD. Study to assess the effects of social networking sites on medical college students. *Int J Med Publ Health* 2017; 3: 1204-1208.



- 23) Krishnamurthy S, Chetlapalli SK. Internet addiction: prevalence and risk factors: a cross-sectional study among college students in Bengaluru, the Silicon Valley of India. *Indian J Public Health* 2015; 59: 115.
- 24) Paul AVR, Ganapathi CK, Duraimurugan M, Abirami V, Reji E. Internet addiction and associated factors: a study among college students in South India. *IJMHS* 2015; 5: 121-125.
- 25) Biernatowska A, Balcerowska JM, Bereznowski P. Gender differences in using Facebook—preliminary analysis, 2017.
- 26) Sadock BJ, Sadock VA. Kaplan and Sadock's synopsis of psychiatry: Behavioral sciences/clinical psychiatry. Lippincott Williams & Wilkins, Baltimore, 2011.
- 27) Müller KW, Koch A, Dickenhorst U, Beutel ME, Duven E, Wölfling K. Addressing the question of disorder-specific risk factors of internet addiction: a comparison of personality traits in patients with addictive behaviors and comorbid internet addiction. *BioMed Res Int* 2013; 546342.
- 28) Błachnio A, Przepiorka A. Personality and positive orientation in Internet and Facebook addiction. An empirical report from Poland. *Comput Hum Behav* 2016; 59: 230-236.
- 29) Kuss DJ, Griffiths MD, Binder JF. Internet addiction in students: Prevalence and risk factors. *Comput Hum Behav* 2013; 29: 959-966.
- 30) Kuss DJ, Shorter GW, van Rooij AJ, Griffiths MD, Schoenmakers T. Assessing Internet addiction using the parsimonious Internet addiction components model – a preliminary study. *Int J Ment Health Addiction* 2014; 12: 351-366.
- 31) Montag C, Flierl M, Markett S, Walter N, Jurkiewicz M, Reuter M. Internet addiction and personality in first-personshooter video gamers. *JMP* 2011; 23: 163.
- 32) Randler C, Horzum MB, Vollmer C. Internet addiction and its relationship to chronotype and personality in a Turkish university student sample. *Soc Sci Comput Rev* 2014; 32: 484-485.
- 33) Anderson EL, Steen E, Stavropoulos V. Internet use and problematic internet use: A systematic review of longitudinal research trends in adolescence and emergent adulthood. *Int J Adolesc Youth* 2017; 22: 430-454.
- 34) Andreassen CS, Griffiths MD, Gjertsen SR, Krossbakken E, Kvam S, Pallesen S. The relationship between behavioral addictions and the five-factor model of personality. *J Behav Addict* 2013; 2: 90-99.
- 35) Durak M, Senol-Durak E. Which personality traits are associated with cognitions related to problematic Internet use? *Asian J Soc Psychol* 2014; 17: 206-218.
- 36) Hwang JY, Choi JS, Gwak AR, Jung D, Choi SW, Lee J, Jung HY, Kim DJ. Shared psychological characteristics that are linked to aggression between patients with Internet addiction and those with alcohol dependence. *Ann Gen Psychiatry* 2014; 13: 6.
- 37) McElroy JC, Hendrickson AR, Townsend AM, DeMarie SM. Dispositional factors in internet use: personality versus cognitive style. *MIS Quarterly* 2007; 809-820.
- 38) Detrick P, Chibnall JT. Frame of reference effects on police officer applicant responses to the revised NEO Personality Inventory. *J Police Crim Psych* 2020; 35: 328-445.
- 39) McCrae RR, John OP: An introduction to the five-factor model and its applications. *Personality* 1992; 60: 175-215.
- 40) Batigün AD, Kiliç N. The Relationships between internet addiction, social support, psychological symptoms and some socio-demographical variables. *Türk Psikoloji Dergisi* 2011; 67: 1.
- 41) Buckner JE, Castille CM, Sheets TL. The five factor model of personality and employees' excessive use of technology. *Comput Hum Behav* 2012; 28: 1947-1953.
- 42) Rahmani S, Lavasani MG. The relationship between internet dependency with sensation seeking and personality. *Procedia Soc Behav Sci* 2011; 30: 272-277.
- 43) Yan W, Li Y, Sui N. The relationship between recent stressful life events, personality traits, perceived family functioning and internet addiction among college students. *Stress Health* 2014; 30: 3-11.
- 44) Ineme ME, Ineme KM, Akpabio GA, Osinowo HO, Helen O. Predictive roles of depression and demographic factors in internet addiction: a cross-sectional study of students in a Nigerian university. *IJCC* 2017; 11: 10-23.
- 45) Hardie E, Tee MY. Excessive internet use: the role of the personality, loneliness and social support networks in internet addiction. *AJECT* 2007; 5: 34-47.
- 46) Tsai HF, Cheng SH, Yeh TL, Shih CC, Chen KC, Yang YC, Yang YK. The risk factors of Internet addiction a survey of university freshmen. *Psychiatry Res* 2009; 167: 294-299.